

In the claims

The following is an amendment to and complete listing of the claims that replaces all prior listings of claims in the application.

1. (currently amended) An automated material handling and storage system for storage and shipping containers, the system comprising, a structure defining a plurality of vertical cells, each cell having a plurality of tier levels and being of a size to cooperatively receive a storage and shipping container ~~[[in]]~~ at each tier level, a grid track system mounted in spaced relationship above said plurality of vertical cells and having a plurality of first tracks extending transversely with respect to and intersecting with a plurality of second tracks ~~one another~~ in an intersecting pattern and which grid track system ~~defining~~ defines openings at each intersection thereof, at least one transfer unit moveably mounted to the said grid track system so as to be suspended therefrom, said at least one transfer unit including a plurality of carriage means for suspending said at least one transfer unit from said grid track system so as to be selectively moveable along spaced ones of said first and second tracks above ~~all of~~ said plurality of cells, said at least one transfer unit including drive means for moving said at least one transfer unit along said grid track system so as to be moveable

in a horizontal plane in both forward to back and side to side motions within the horizontal plane, a spreader beam, hoist means carried by said at least one transfer unit for raising and lowering said spreader beam, said spreader beam being of a size to cooperatively engage a storage and shipping container within one of said cells, at least one guide member extending between said spreader beam and said at least one transfer unit to stabilize said spreader beam with respect to said transfer unit to thereby control movement of a storage and shipping container carried by said spreader beam when the storage and shipping container is elevated above said plurality of cells, and means for providing electrical power to said drive means of said at least one transfer unit.

2.(previously presented) The automated material and handling system of claim 1 in which said cells are mounted within a hold of a vessel, said grid track system being mounted above said cells at a vertical height to permit movement of said at least one transfer unit and said spreader beam to which a storage and shipping container is secured, and a plurality of deck plates mounted above said grid track system.

3.(currently amended) The automated material and handling and storage system of claim 1 in which said grid track system

includes a plurality of rack members extending along each of [[the]] said first and second tracks of the system, said drive means including at least one first drive motor which is powered by said means for providing electrical power to said drive means of said at least one transfer unit, said at least one first drive motor being drivingly connected to at least one first drive gear that is selectively engageable with said rack members, and first means for selectively engaging and disengaging said at least one first drive gear with said rack members.

4.(currently amended) The automated material handing and storage system of claim 3 wherein said at least one first drive gear is selectively engageable with [[a]] first ~~set of~~ rack members extending in a first direction along said first tracks, at least one second drive motor drivingly connected to at least one second drive gear, and second means for selectively engaging and disengaging said at least one second drive gear with second rack members extending in a second direction along said second tracks ~~that is perpendicular to said first direction~~ .

5.(currently amended) The automated material handing and storage system of claim 4 wherein said at least one first drive gear is mounted to a first movable housing that is movable between a first position wherein said at least one first drive

gear is spaced from said first rack members to a second position wherein said at least one first drive gear is in engagement with said first rack members, said at least one second drive gear being mounted to a second movable housing that is movable between a first position wherein said at least one second drive gear is spaced from said second rack members to a second position wherein said at least one second drive gear is in engagement with said second rack members, and means to lock said first and second ~~housing~~ movable housings in said second positions thereof.

6. (currently amended) The automated material handing and storage system of claim 5 ~~in which said means for moveably supporting said at least one transfer unit includes a plurality of carriage assemblies, wherein~~ each carriage assembly ~~including~~ includes a plurality of roller elements mounted to a body, each body being of a size to be cooperatively received within an open channel defined by each of said first and second tracks of said grid track system, each of said carriages including a pilot shaft extending downwardly from said body and through said open channel defined in each of said first and second tracks of said grid track system, and means for connecting said pilot shafts to said at least one transfer unit to thereby support said at least one transfer unit in suspended relationship from said grid track system.

7.(currently amended) The automated material handling and storage system of claim 1 in which said at least one guide member includes [[a]] at least one first guide member mounted to said at least one transfer unit and [[a]] at least one second guide member mounted to said spreader beam, one of said first and second guide members being a fixed probe and the other including a telescoping probe receiver of a configuration to cooperatively receive said probe so as to prevent swaying or rotational movement of said ~~probe relative to said probe receiver~~ spreader beam with respect to said transfer unit.

8.(previously presented) The automated material handling and storage system of claim 7 including at least two hoist assemblies mounted to said at least one transfer unit for controlling movement of said spreader beam, each hoist assembly including a pair of winding drums for controlling cables connected to said spreader frame, and at least one hoist motor drivingly connected to each hoist assembly.

9.(currently amended) The automated material handling and storage system of claim 1 wherein said at least one transfer unit includes at least one drive motor for driving said at least one transfer in a first direction along said first tracks and at least one drive motor for driving said transfer units in a second

direction along said second tracks.

10.(previously presented) The automated material handling and storage system of claim 5 wherein said at least one first drive motor drives a pair of first drive gears and said at least one second drive motor drives a pair of second drive gears.

11.(currently amended) The automated material handling and storage system of claim 10 including guide means positioned between each of said pair of first and second drive gears for cooperatively guiding said pair of first and second drive gears relative to said first and second rack members, and said first and second rack members being placed on opposite sides of an open channel defined by said first and second [[guide]] tracks of said grid track system.

12.(currently amended) The automated material handling and storage system of claim 1 in which said means for providing energy includes an inductive power raceway mounted adjacent said first and second tracks of said grid track system.

13.(currently amended) The automated material handling and storage system of claim 11 ~~in which said means for moveably supporting said at least one transfer unit includes a plurality~~

~~of carriage assemblies, wherein~~ each carriage assembly ~~including~~ includes a plurality of roller elements mounted to a body, each body being of a size to be cooperatively received within a channel defined by each of said first and second tracks of said grid track system, each of said carriages including a pilot shaft extending downwardly from said body and through said open channel defined in each of said first and second tracks of said grid track system, and means for connecting said pilot shafts to said at least one transfer unit to thereby support said at least one transfer unit in suspended relationship from said grid track system.

14.-17. (canceled)

18. (previously presented) The automated material handling and storage system of claim 7 wherein said at least one guide means includes a plurality of guide arms that extend downwardly from said at least one transfer unit for engaging said spreader beam as said spreader beam is raised above said plurality of cells.

19. (previously presented) The automated material handling and storage system of claim 18 wherein said guide arms are secured to said at least one transfer unit so as to engage with

corners of said spreader beam, and each of said guide arms having two guide walls that are oriented approximately perpendicular relative to one another and which are flared outwardly at a lower portion thereof.

20. (previously presented) The automated material handling and storage system of claim 19 including two hoist assemblies mounted to said at least one transfer unit, each hoist assembly including a pair of winding drums for controlling cables connected to said spreader frame, and at least one hoist motor drivingly connected to each hoist assembly.

21. (previously presented) The automated material handling and storage system of claim 1 including a plurality of transfer units operatively mounted to said grid track system.

22. (currently amended) The automated material handling and storage system of claim 1 wherein ~~said tracks include first track members extending in a first direction and second track members extending in a second direction generally perpendicular to the first track members,~~ said drive means ~~including~~ includes first drive members for engaging said spaced and parallel first track members and second drive members for engaging said spaced and parallel second track members, and at least one first motor

drivingly connected to said first drive members and at least one second motor drivingly connected to said second drive members.

23.(previously presented) The automated material handling and storage system of claim 1 wherein said at least one guide means includes a plurality of guide arms that extend downwardly from said at least one transfer unit for engaging said spreader beam as said spreader beam is raised above said plurality of cells.

24.(currently amended) An automated material handling and storage system for storage and shipping containers, the system comprising, a structure defining a plurality of vertical cells that are arranged in side by side and end to end relationship relative to one another, each of said cell defining a plurality of tier levels and being of a size to cooperatively receive a storage and shipping container ~~in each~~ at a plurality of tier ~~[[level]] levels,~~ a grid track system mounted in spaced relationship above all of said cells and having a plurality of first spaced and parallel tracks that intersect transversely with a plurality of second spaced parallel tracks extending transversely with respect to one another in an intersecting pattern, at least one transfer unit moveably suspended from said grid track system so as to be selectively moveable along either

spaced first tracks or spaced second tracks in an X-Y motion above [[all of]] said plurality of cells, said at least one transfer unit including a plurality of carriage means for suspending said at least one transfer unit from said grid track system, said at least one transfer unit including first drive means for moving said at least one transfer unit along said grid track system so as to be moveable in a horizontal plane in a forward to back motion and second drive means for moving in the horizontal plane in a side to side motion, a spreader beam, hoist means carried by said at least one transfer unit for raising and lowering said spreader beam by way of cable elements controlled by said hoist means, said spreader beam being of a size to cooperatively engage a storage and shipping container within one of said cells, at least one first guide member extending from said spreader beam and cooperatively engaging at least one second guide member mounted to and extending from said at least one transfer unit, said first and second guide members being engageable with one another to stabilize said spreader beam with respect to said transfer unit to thereby control movement of a storage and shipping container carried by said spreader beam when the storage and shipping container is elevated above said plurality of cells, and means for providing electrical power to said at least one transfer unit.